

IN THE CLAIMS

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please **AMEND** claims 1-25 as follows.

Please **ADD** new claim 26 as follows.

1. (CURRENTLY AMENDED) An information processing apparatus for displaying a plurality of linked information objects in a virtual space ~~in accordance with~~according to visual field data, ~~a particular~~the information object~~objects~~ representing ~~a~~a respective content of a particular items of different content types, said visual field data defining a visual field in said virtual space, said apparatus comprising:

holding means for holding, in an executable manner, a plurality of different intermediate data generating means specific to said respective different content types of the information objects for generating respective pieces of intermediate data for display, and for holding, in an executable manner, a plurality of different display image generating means specific to said respective different content types of the information objects for generating a respective display imageimages from said respective generated pieces of intermediate data;

first means for causing said plurality of different intermediate data generating means to generate the respective pieces of intermediate data for displaying said respective particular information object~~objects~~ of the different content types, when it is determined, in accordance with~~determined according to~~ a geometric relation between said visual field and said respective particular information object, ~~that objects to generate said respective pieces of intermediate data of said respective particular information object should be generated~~objects; and

second means for causing said plurality of different display image generating means to generate a display imageimages of said respective particular information object~~objects~~ from said respective generated pieces of intermediate data, when it is determined, in accordance with~~determined according to~~ the geometric relation between said visual field and said respective particular information object, ~~that objects to display said respective particular information object should be displayed~~objects.

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2. (CURRENTLY AMENDED) The information processing apparatus according to Claim 1 wherein said each intermediate data generating means and said each display image generating means operate asynchronously with each other for a respective content type of a particular information object.

3. (CURRENTLY AMENDED) The information processing apparatus according to Claim 1 wherein said first and second means are controlled by control means; and said each intermediate data generating means operates under the control of said first means, to generate and renew said a piece of intermediate data for displaying said a particular information object, and each said display image generating means operating operates simultaneously with said each respective intermediate data generating means for the particular information object, under the control of said second means, to generate a display image of said the particular information object from said generated and renewed piece of intermediate data.

4. (CURRENTLY AMENDED) The information processing apparatus according to Claim 1 wherein said holding means holds at least one a plurality of information object content type specific data processing means, said at least one each information object content type specific data processing means including at least intermediate data generating means for generating a piece of intermediate data of a particular information object of one content type and display image generating means for generating a display image from the piece of intermediate data of the particular information object of said one content type.

5. (CURRENTLY AMENDED) The information processing apparatus according to Claim 1 wherein said holding means holds in an executable manner at least a plurality of different data processing means specific to said different content typetypes of the information objects, said each data processing means including corresponding one of said intermediate data generating means for generating a piece of intermediate data for a content type of a particular information object, corresponding one of said display image generating means, corresponding content data capturing means specific to said content type for capturing content data of said particular information object, and corresponding intermediate data deleting means specific to said content type for deleting said generated piece of intermediate data in an intermediate data memory.

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6. (CURRENTLY AMENDED) The information processing apparatus according to Claim 1 wherein saideach intermediate data generating means is implemented in form of intermediate data generating as program codes, and saideach display image generating means is implemented in the form of display image generating as program codes; and
said apparatus further comprises further data capturing means for capturing said intermediate data generating program codes and said display image generating program codes into said holding means from an external device or a communication line.

7. (CURRENTLY AMENDED) The information processing apparatus according to Claim 1 further comprising:

visual field data managing means for smoothly changing said visual field data according to an input command; and

display means for displaying the generated display images of said respective particular information objects

~~a memory for storing therein said generated intermediate data;~~

~~a display memory; and~~

~~means for rendering said display image on to said display memory;~~

~~said first means determining for each of said plurality of information objects whether or not intermediate data for displaying that information object should be generated, in accordance with the geometric relation between said visual field and that information object;~~

~~said second means determining for each of the information objects for which intermediate data has been generated whether a display image of that information object should be generated from said generated intermediate data, in accordance with the geometric relation between said visual field and that information object.~~

8. (CURRENTLY AMENDED) The information processing apparatus according to Claim 1 further comprising:

means for assigning a display priority to each of said plurality of information objects;

said first means comparing said display priority of said a particular information object with a predetermined threshold to thereby determine whether or not the to generate a piece of intermediate data of said particular information object should be generated;

said second means comparing said display priority of said particular information object with a predetermined threshold to thereby determine whether or not the to generate a display image of said particular information object should be generated.

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9. (CURRENTLY AMENDED) The information processing apparatus according to ~~Claim~~claim 1 wherein:

 said holding means further holds a plurality of different intermediate data deleting means specific to said respective different content types for deleting said respective generated pieces of intermediate data;

 said information processing apparatus further comprises a memory region for storing therein said intermediate data and managing data for said particular information ~~objects~~objects, and means for assigning display priorities to respective ones of said plurality of information objects;

 said first means comparing said display priority of said a particular information object with a predetermined threshold to thereby determine whether ~~or not the~~ to generate or renew a piece of intermediate data of said particular information object should be generated or renewed;

 said first means causing corresponding one of said intermediate data generating means to generate or renew piece of intermediate data of said particular information object when the display priority of said particular information object is higher than the predetermined threshold;

 said first means causing corresponding one of said data deleting means to delete said piece of intermediate data of said particular information object in said memory region when the display priority of said particular information object is lower than a predetermined threshold;

 said first means deleting the managing data of said particular information object in said memory region when the display priority of said particular information object is lower than a predetermined threshold.

10. (CURRENTLY AMENDED) The information processing apparatus according to ~~Claim~~claim 1 wherein ~~said~~each display image generating means determines a form in which said a display image is displayed, ~~in accordance with~~according to the geometric relation between said visual field and said a particular information object.

11. (CURRENTLY AMENDED) The information processing apparatus according to ~~Claim~~claim 1 wherein display priorities are assigned to respective ones of said plurality of information objects; and when ~~the~~a display image of said a particular information object is to be displayed, said a corresponding one the display image generating means determines a form in which said display image of said particular information object is to be displayed, ~~in accordance~~

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with the according to a display priority of said particular information object.

12. (CURRENTLY AMENDED) The information processing apparatus according to Claimclaim 1 further comprising:

a memory region for storing therein display data including the pieces of intermediate data for displaying said plurality of information objects; and

memory managing means for detecting an amount of said memory region occupied by said display data and time-sequentially deleting from said memory region at least part of the pieces of intermediate data in said memory region which has not been used for display image generation for thea longest time.

13. (CURRENTLY AMENDED) The information processing apparatus according to Claimclaim 1 further comprising:

third means for selecting one of said plurality of information objects as a representative object and defining said visual field by defining a geometric relation of said representative object to said visual field;

said third means altering said representative object, without changing the geometric relations of said plurality of information objects to said visual field, as said visual field shifts in said virtual space;

said first means traversing linkages between said plurality of information objects, starting with said representative object, to thereby determine whether or not said to generate a piece of intermediate data of said a particular information object should be generated.

14. (CURRENTLY AMENDED) The information processing apparatus according to Claimclaim 13 wherein display priorities are assigned to respective ones of said plurality of information objects, and said third means selects one of said plurality of information objects having a highest display priority as said representative object.

15. (CURRENTLY AMENDED) A program stored on a A computer readable data storage medium storing at least one program controlling a computing apparatus for use with an information processing apparatus for displaying a plurality of linked information objects in a virtual space in accordance with according to visual field data, a particular the information objectobjects representing a respective content items of different of a particular content typetypes, said visual field data defining a visual field in said virtual space, said apparatus

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including according to a process comprising:

a holding region for holding storing, in an executable manner, a plurality of different information object content type specific programs program specific to said respective content type being operable to effect the steps of types of the information objects, each information object content type specific program generating intermediate data specific to said content type of a particular information object, and generating a display image specific to said content type of the particular information object from said generated intermediate data;

said first program being operable to effect the steps of:

causing the intermediate data for displaying said particular information object to be generated, according to in the intermediate data generating step, when it is determined, in accordance with a geometric relation between said visual field and said particular information object, that said intermediate data of said particular information object should be generated; and

causing a the display image of said particular information object to be generated from said generated intermediate data, according to in the display image generating step, when it is determined, in accordance with the geometric relation between said visual field and said particular information object, that said particular information object should be displayed.

16. (CURRENTLY AMENDED) The program computer readable storage according to Claim 15, wherein the process further comprises being operable to asynchronously performing the effect the step of causing the intermediate data to be generated with the step of causing a the display image to be generated.

17. (CURRENTLY AMENDED) The program computer readable storage according to Claim 15, wherein the process further comprises performing the causing the intermediate data to be generated or renewed simultaneously with the causing the display image to be generated being operable to further effect the step of controlling to call the intermediate data generating step to thereby cause the intermediate data for displaying said information object to be generated and renewed, and simultaneously, call the display image generating step to thereby cause the display image of said information object to be generated from said generated and renewed intermediate data.

18. (CURRENTLY AMENDED) The program computer readable storage according to Claim 15 wherein said holding region includes a region for holding storing comprises storing, in an executable manner, at least one information object content type specific

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processing program, said at least one information object content type specific processing program being operable to effect at least the steps of: performing the generating the intermediate data of ~~an~~ the particular information object of one content type, and generating a display image of the particular information object of said one content type.

19. (CURRENTLY AMENDED) The programcomputer readable storage according to Claimclaim 15 wherein ~~said~~each information object content type specific program specific to the content type is operable to further effect the steps of: capturing captures information object content data of corresponding said content type, and ~~deleting~~deletes intermediate data of said corresponding content type in an intermediate data memory.

20. (CURRENTLY AMENDED) The programcomputer readable storage according to Claimclaim 15 being operable to wherein the process further effect the steps ofcomprises:

assigning display priorities to respective ones of said plurality of information objects;

comparing said display priority of said particular information object with a predetermined threshold to thereby determine whether or not to generate the intermediate data of said particular information object should be generated; and

comparing said display priority of said particular information object with a predetermined threshold to thereby determine whether or not to generate the display image of said particular information object should be generated.

21. (CURRENTLY AMENDED) The programcomputer readable storage according to Claimclaim 15 wherein ~~said~~each information object content type specific program specific to said content type is operable to further effect the step of ~~deleting~~deletes said generated intermediate data; the step of generating intermediate data includes storing said intermediate data in data from a memory; and

said first program being operable to further effect the steps ofprocess further comprises:

assigning display priorities to respective ones of said plurality of information objects;

comparing said display priority of said particular information object with a predetermined threshold to thereby determine whether or not to generate or renew said intermediate data of said particular information object should be generated or renewed;

causing said intermediate data of said particular information object to be generated or renewed in the intermediate data generating step, when the display priority of said particular information object is higher than the predetermined threshold;

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causing said intermediate data of said particular information object in said memory to be deleted in the ~~data deleting step~~, when the display priority of said particular information object is lower than a predetermined threshold.

22. (CURRENTLY AMENDED) The ~~program~~computer readable storage according to ~~Claim~~claim 15 ~~being operable to further effect the step of~~wherein the process further comprises assigning display priorities to respective ones of said plurality of information objects; the ~~generating of the display image comprising~~ generating step including, when the display image of said particular information object is to be displayed, determining a form in which said display image of said particular information object is displayed, in accordance with ~~according to~~ the display priority of said particular information object.

23. (CURRENTLY AMENDED) The ~~program~~computer readable storage according to ~~Claim~~claim 15 wherein the intermediate data generating step ~~includes~~comprises storing data for display including ~~generated~~ intermediate data for displaying said plurality of information objects in a memory ~~region~~region, and ~~said program is operable to further effect the steps of~~the process further comprises:

detecting an amount of said memory region occupied by said display data; and sequentially deleting ~~in said memory region~~ at least part of ~~the generated~~ intermediate data ~~in said memory region~~ which has not been used for display image generation for ~~the~~ longest time.

24. (CURRENTLY AMENDED) The ~~program~~computer readable storage according to ~~Claim~~claim 15 ~~being operable to further effect the step of~~wherein the process further comprises selecting one of said plurality of information objects as a representative object and defining said visual field by defining a geometric relation of said representative object to said visual field; ~~field~~, the selecting step including ~~comprising~~ altering said representative object, without changing the geometric relations of said plurality of information objects to said visual field, as said visual field shifts in said virtual space; ~~space~~,

wherein said program being operable to further effect the step of~~process further comprises~~ traversing linkages between said plurality of information objects, starting with said representative object, to thereby cause intermediate data of ~~one of the~~ an information object in said plurality of information objects to be generated.

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25. (CURRENTLY AMENDED) ~~A in an information processing apparatus, a method for displaying in a computing apparatus a plurality of linked information objects in a virtual space in accordance with according to visual field data, a particular the information object objects representing a respective content items of a particular different content types, said visual field data defining a visual field in said virtual space, said method comprising the steps of:~~

~~processing different data specific to said respective different content types of the information objects by, including generating a piece of intermediate data specific to said content type of a particular information object and generating a display image specific to said content type of the particular information object from said generated intermediate data;~~

~~causing the piece of intermediate data for displaying said particular information object having the content type to be generated, according to in said intermediate data generating step, when it is determined, in accordance with a geometric relation between said visual field and said particular information object, that said intermediate data of said particular information object should be generated; and~~

~~causing a the display image of said particular information object having the content type to be generated from said generated intermediate data, according to in the display image generating step, when it is determined, in accordance with the geometric relation between said visual field and said particular information object, that said particular information object should be displayed.~~

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26. (NEW) A computing apparatus that displays a plurality of linked information objects in a virtual space according to visual field data, the linked information objects representing different content types, the visual field data defining a visual field in the virtual space, the apparatus comprising:

a data storage that stores, in an executable manner, a plurality of intermediate data generators, each corresponding to a different content type of the linked information objects to generate display intermediate data of the linked information objects, and stores a plurality of display image generators, each corresponding to the different content types of the linked information objects to generate display images from corresponding generated display intermediate data of the linked information objects;

an object data manager causing one of the intermediate data generators corresponding to a content type of a representative information object to generate display intermediate data to display the representative information object, according to a geometric relation between the visual field and the representative information object; and

an image generator causing one of the display image generators corresponding to the content type of the representative information object to generate a display image of the representative information object from the generated display intermediate data of the representative information object, according to the geometric relation between the visual field and the representative information object.